

Claims

1. A battery pack device for a mobile communication terminal comprising:

5           at least one battery cell for supplying a DC power to a body of the mobile communication terminal via power supply terminals;

          an additional circuit unit for providing additional functions to the terminal body; and

10           a control unit for controlling an operation of the additional circuit unit while performing data transmission and reception with respect to an external device, the control unit including

          an additional function processor for controlling  
15           the additional circuit unit, and

          a communication unit for performing data transmission and reception with respect to the terminal body, the communication unit including a communication controller for transforming data obtained in accordance  
20           with a data processing operation of the additional function processing unit into data having a predetermined transmission format, while supplying data, externally received thereto, to the additional function processor as an operating command, a  
25           modulator/demodulator for performing a

modulation/demodulation for data to be sent to the communication controller or received from the communication controller, and a transmitter/receiver for receiving modulated data received from the modulator/demodulator while transmitting data, to be demodulated, to the modulator/demodulator.

2. The battery pack device according to claim 1, wherein:

10 the battery pack device further comprises a detecting unit for detecting the amount of electric power supplied to the power supply terminals; and

the control unit further includes a power controller for controlling respective power consumption levels of circuits internally provided at the battery pack device in accordance with the amount of electric power detected by the detecting unit.

20 3. The battery pack device according to claim 2, wherein:

the detecting unit includes current detecting means for detecting output current at the power supply terminals; and

the power controller is adapted to switch an operating mode of the control unit to a low-power driving mode while cutting off the supply of electric power to the additional

circuit unit when the output current detected by the current detecting means is not more than a predetermined level.

4. The battery pack device according to claim 1, wherein  
5 the control unit further includes a power controller for controlling respective power consumption levels of circuits internally provided at the battery pack device in accordance with a power management mode command from the terminal body received via the communication unit.

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5. The battery pack device according to any one of claims 1 to 4, wherein the transmitter/receiver includes:

a choke filter connected between the battery cell and the power supply terminals; and

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a capacitance element connected, at one end thereof, to a line branching from a line between the choke filter and the power supply terminals, and adapted to cut off DC components.

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6. The battery pack device according to any one of claims 1 to 4, wherein the transmitter/receiver is a coil arranged in the form of a plate extending along a coupling surface of the battery pack device to be coupled with a facing coupling surface of the terminal body so that it faces a coil arranged at the coupling surface of the terminal body in a  
25 state in which the battery pack device is coupled to the

terminal body, thereby forming a transformer.

7. The battery pack device according to claim 6, wherein  
the modulator/demodulator is of an FM system operating at a  
5 relatively low frequency.

8. The battery pack device according to any one of  
claims 1 to 4, wherein the modulator/demodulator is a  
Bluetooth RF transmitting/receiving module.

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9. The battery pack device according to any one of  
claims 1 to 4, wherein the transmitter/receiver is an infrared  
transmitter/receiver installed at an opening formed at a  
coupling surface of the battery pack to be coupled with a  
15 facing coupling surface of the terminal body.

10. The battery pack device according to any one of  
claims 1 to 4, wherein the transmitter/receiver includes  
connecting pins protruded from the battery pack device, and  
20 adapted to elastically come into electrical contact with an  
electrode plate installed at the terminal body.

11. A mobile communication terminal comprising a keypad,  
a display unit, an RF communication interface, and a main  
25 control unit for controlling the units of the terminal body,

further comprising:

a power supply unit for processing a DC power received from a battery pack device via power supply terminals, and supplying the processed DC power to the entire system of a body of the mobile communication terminal;

an additional function processing unit for processing an additional function of the battery pack device; and

a communication unit for performing data transmission and reception with respect to the battery pack device, the communication unit including

a communication controller for transforming data obtained in accordance with a data processing operation of the additional function processing unit into data having a desired transmission format, while supplying data received from the battery pack device to the additional function processing unit,

a modulator/demodulator for performing a modulation/demodulation for data to be sent to the communication controller or received from the communication controller, and

a transmitter/receiver for receiving modulated data received from the modulator/demodulator while transmitting data, to be demodulated, to the modulator/demodulator.

12. The mobile communication terminal according to claim 11, wherein the transmitter/receiver includes:

a choke filter connected between the power supply unit and the power supply terminals; and

5 a capacitance element connected, at one end thereof, to a line branching from a line between the choke filter and the power supply terminals, and adapted to cut off DC components.

13. The mobile communication terminal according to claim 10 11, wherein the transmitter/receiver is a coil arranged in the form of a plate extending along a coupling surface of the terminal body to be coupled with a facing coupling surface of the battery pack device so that it faces a coil arranged at the coupling surface of the battery pack device in a state in 15 which the battery pack device is coupled to the terminal body, thereby forming a transformer.

14. The mobile communication terminal according to claim 13, wherein the modulator/demodulator is of an FM system 20 operating at a relatively low frequency.

15. The mobile communication terminal according to claim 11, wherein the modulator/demodulator is a Bluetooth RF transmitting/receiving module.

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16. The mobile communication terminal according to claim 11, wherein the transmitter/receiver is an infrared transmitter/receiver installed at an opening formed at a coupling surface of the terminal body to be coupled with a facing coupling surface of the battery pack device.

17. In a mobile communication terminal including a smart card slot, a communication connector for connecting a circuit internally provided at a battery pack to a body of the mobile communication terminal, the communication connector comprising:

a first connector section including a housing having an outer structure of a desired shape, and terminal members provided at the housing, each of the terminal members being electrically connected, at one end thereof, with an associated one of terminals provided at a lower surface of a smart card, while being electrically connected, at the other end thereof, with an associated one of terminals provided at a printed circuit board (PCB) included in the mobile communication terminal; and

a second connector section including a clip member for receiving the smart card such that it is in close contact with at least a part of the lower surface of the smart card and at least a part of an upper surface of the smart card while covering the upper and lower surface parts, an upper

connecting member provided at an upper surface of the clip member while having a plurality of terminals each electrically connected with an associated one of terminals extending from the circuit internally provided at the battery pack to a lower surface of the battery pack, a lower connecting member provided at a lower surface of the clip member while having a plurality of terminals each electrically connected with an associated one of terminals provided at the lower surface of the smart card, and an intermediate connecting member adapted to electrically connect associated terminals of the upper and lower connecting members.

18. The communication connector according to claim 17, wherein the PCB of the mobile communication terminal outputs includes a microprocessor for outputting a first enable signal to the smart card while outputting a second enable signal to the battery pack circuit.

19. The communication connector according to claim 17 or 18, wherein the intermediate connecting member comprises patterns printed on a surface of the clip member.

20. In a mobile communication terminal including a smart card slot, a communication connector for connecting a circuit internally provided at a battery pack to a body of the mobile



communication terminal, the communication connector comprising:

5 a first connector section including a housing having an outer structure of a desired shape, and terminal members provided at the housing, each of the terminal members being electrically connected, at one end thereof, with an associated one of terminals provided at a lower surface of a smart card, while being electrically connected, at the other end thereof, with an associated one of terminals provided at a printed  
10 circuit board (PCB) included in the mobile communication terminal;

a guide member adapted to guide and detachably mount the smart card while having holders adapted to cover at least a part of an upper surface of the smart card, thereby holding  
15 the smart card; and

a second connector section including an upper connecting member having a plurality of terminals provided at respective upper surfaces of the holders, and electrically connected with terminals extending from a circuit internally provided at the  
20 battery pack to a lower surface of the battery pack, a lower connecting member having a plurality of terminals each electrically connected with one of one end or the other end of an associated one of the terminals included in the first connector section or an associated one of the terminals  
25 provided at the PCB, and an intermediate connecting member

adapted to electrically connect associated terminals of the upper and lower connecting members.

21. The communication connector according to claim 20,  
5 wherein the PCB of the mobile communication terminal outputs includes a microprocessor for outputting a first enable signal to the smart card while outputting a second enable signal to the battery pack circuit.

10 22. The communication connector according to claim 20 or 21, wherein the intermediate connecting member comprises patterns printed on a surface of the terminal body.

23. The communication connector according to claim 20 or  
15 21, wherein the intermediate connecting member comprises elastic members each having a bent structure.

24. In a mobile communication terminal including a smart card slot, a communication connector for connecting a circuit  
20 internally provided at a battery pack to a body of the mobile communication terminal, the communication connector comprising:

a first connector section including a housing having an outer structure of a desired shape, and terminal members  
25 provided at the housing, each of the terminal members being

electrically connected, at one end thereof, with an associated one of terminals provided at a lower surface of a smart card, while being electrically connected, at the other end thereof, with an associated one of terminals provided at a printed circuit board (PCB) included in the mobile communication terminal; and

a second connector section including a clip member for receiving the smart card such that it is in close contact with at least a part of the lower surface of the smart card and at least a part of an upper surface of the smart card while covering the upper and lower surface part, an upper connecting member provided at an upper surface of the clip member while having a plurality of terminals each electrically connected with an associated one of terminals extending from a circuit (not shown) internally provided at the battery pack to a lower surface of the battery pack, a lower connecting member provided at a lower surface of the clip member while having a plurality of terminals each electrically connected with an associated one of battery pack circuit communication terminals provided at the PCB, and an intermediate connecting member adapted to electrically connect associated terminals of the upper and lower connecting members.

25. The communication connector according to claim 24, wherein the terminals of the lower connecting member included

in the second connector section are connected with the battery pack circuit communication terminals of the PCB in a male/female board-to-board connection fashion.

5           26. The communication connector according to claim 24, wherein the PCB of the mobile communication terminal includes:  
             a first buffer for buffering data transmitted between a microprocessor provided at the PCB and the smart card; and  
             a second buffer for buffering data transmitted between  
 10          the microprocessor and the battery pack circuit.

            27. The communication connector according to claim 24, wherein the intermediate connecting member comprises patterns printed on a surface of the clip member.

15           28. In a mobile communication terminal including a smart card slot, a communication connector for connecting a circuit internally provided at a battery pack to a body of the mobile communication terminal, the communication connector  
 20          comprising:

            a first connector section including a housing having an outer structure of a desired shape, and terminal members provided at the housing, each of the terminal members being electrically connected, at one end thereof, with an associated  
 25          one of terminals provided at a lower surface of a smart card,

while being electrically connected, at the other end thereof, with an associated one of terminals provided at a printed circuit board (PCB) included in the mobile communication terminal;

5           a guide member adapted to guide and detachably mount the smart card while having holders adapted to cover at least a part of an upper surface of the smart card, thereby holding the smart card; and

          a second connector section including an upper connecting  
10       member having a plurality of terminals provided at respective upper surfaces of the holders, and electrically connected with terminals extending from a circuit internally provided at the battery pack to a lower surface of the battery pack, a lower  
15       connecting member having a plurality of terminals each electrically connected with an associated one of battery pack circuit communication terminals provided at the PCB, and an intermediate connecting member adapted to electrically connect associated terminals of the upper and lower connecting members.

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29. The communication connector according to claim 28, wherein the PCB of the mobile communication terminal includes:

          a first buffer for buffering data transmitted between a microprocessor provided at the PCB and the smart card; and

25           a second buffer for buffering data transmitted between

the microprocessor and the battery pack circuit.

30. The communication connector according to claim 28 or  
29, wherein the intermediate connecting member comprises  
5 patterns printed on a surface of the terminal body.

31. The communication connector according to claim 28 or  
29, wherein the intermediate connecting member comprises  
elastic members each having a bent structure.

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